

## MIDWAY MFG. CO.

PHONE: AREA CODE TO A TR 350

3750 RIVER ROAD . SCHILLER PARK, ILLINOIS 60175

## $\underline{N} \ \underline{E} \ \underline{W} \qquad \underline{R} \ \underline{E} \ \underline{L} \ \underline{E} \ \underline{A} \ \underline{S} \ \underline{E} \quad .$

Midway's "Winner"

Midway's new table tennis game, WINNER, will be in your distributor's showroom soon. This game is being built under license and with the co-operation of Atari, Inc., of Santa Clara, California, (Syzygy Engineered), the inventor and developer of the game.

Midway has reaped the benefits of months of location testing. WINNER lends itself to the sophisticated atmosphere of all locations. This unit has extra circuitry to allow the audience to view the match play on the location's television set, if desired.

The fascinating, competitive play has caught the eye of every age group, and has made it the most exciting game of the decade.

The outside dimensions are 26 1/2" wide X 23 7/8" deep x 64" high.

Sincerely,

MIDWAY MFG. CO.

Larr 🗗 Befke

Director of Sales

LB/r

#### **GAME OVER**

Energized when selected time is reached.

#### **CREDIT**

Energized via coin sws. to start game via Credit Button when start Jack is in top pos.

#### COIN

Energized via coin sws. or Credit Button dependent on start Jack pos.

## GAME TIMER

P.C. 567-907

CREDIT **ONE-SHOT** UNIT P.C. 567-911

#### START CONTROL **JACK**

starts game via

- Credit Button
- Coin Switches

## WINNER "19" EQUIPMENT CHART

TIMER **ADJUSTMENT** JACK

- OFF

- 5 MIN.

COIL	PER	APPLICATION		
M-33-1700 D.C.	3	Coin, Credit & Game-Over relay coils.		
MT-37	1	60 Cycle Transformer		
MT-38	1	50 Cycle Transformer		
		PRINTED CIRCUITS		
567-904	1	Game Logic		
567-907	1	Game-Over Timer		
567-911	1 1	Credit One-Shot		

P.C. 567-904 WINNER LOGIC UNIT 18 MONTH UNCONDITIONAL WARRANTY

### POLARITY LAMP CAUTION

If Polarity Lamp is lit reverse TV. Set Line Cord in order to prevent electrical shock

AS OF CAME #668

WINNER 4-73 PACKARD BELL 19" TV

## SERVICE BULLETIN

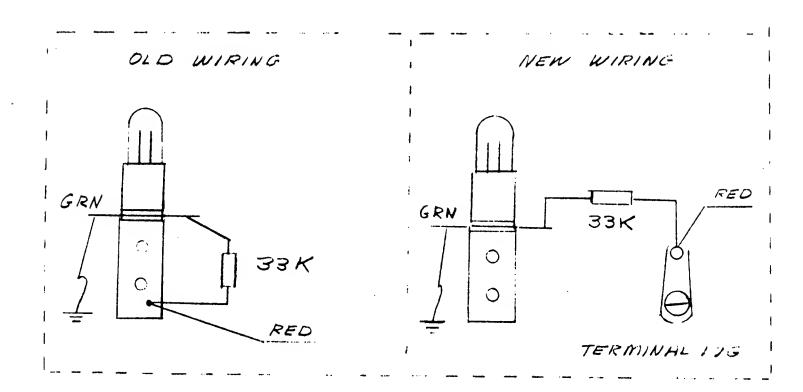
GAME: Winner 19

#### CONDITION:

Possible polarity lamp socket shorting causing damage to cable and logic P.C. 567-904.

Please make the following modifications in games with Serial Numbers 675 thru 2600:

- 1.) Remove 33K resistor and red wire from lamp socket bracket.
- 2.) Solder 33K resistor and red wire to new terminal lug as shown.



NEON POLARITY LITE

### General Instructions for WINNER

#### Installation:

The power is controlled by a switch located on top of the cabinet. Plug into A.C. only, 115 volts, 60 cycles.

Equipment Panel and Logic Unit:

Located in back box area and are easily serviced by removing back door.

Score Slide Switch:

Located on Logic Unit to end game at 11 or 15 points.

Timer Jack:

Located on equipment panel. This jack is provided as an optional feature and is adjustable from 5, 6, or 7 minutes. In the "OFF" position, the game will end when designated score is reached.

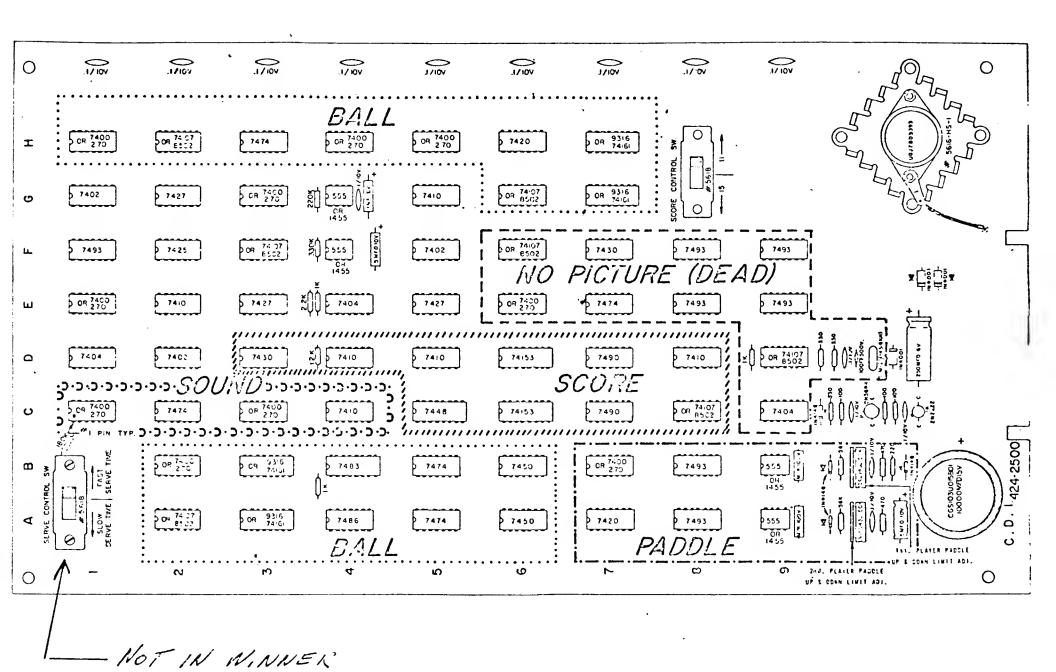
Volume Control:

Located on top of cabinet. To increase volume, rotate in a clockwise direction.

MIDWAY MFG. CO.

3750 River Road

Schiller Park, Illinois



## TROUBLE SHOOTING - WINNER LOGIC PC567-904

Location	Chip No.	Possible Trouble
A2	74107	No Ball
<b>A</b> 3	9316	Series of Balls - No Audio
<b>A</b> 4	7486	Distorted Video (Picture Rolls)
A5	7474	No Ball
<b>A</b> 6	7450	Prevents ball from traveling downward
A7	7420	Distorted Paddles
<b>A8</b>	7493	No Right Paddle
<b>A</b> 9	NE555	No Right Paddle
. B2	7400	No Paddles - No Audio - No Score Ball Travels from top to bottom at rapid rate
B3	9316	Series of Distorted Balls - Distorted Audio
B <b>4</b>	7483	Ball Serves Rapidly from bottom up
B5	7474	No Ball - No Score
B6 ·	<b>7</b> 450	Ball Travels from bottom up
B <b>7</b>	7400	Stays in Game Over
B8	7493	No Left Paddle - No Ball
B9	NE555	No Left Paddle - No Ball - No Audio
Cl	7400	No Audio
C2	7474	Audio Distortion (Also no hit Audio)
 C3	7400	Distorted Display - No Audio
C4	7410	Distorted Display - No Audio
<b>C</b> 5	7448	Distorted Series of Displays
06 07 08 09	74153 7490 74107	Scores Incorrect No Left Display First Score Kills Game

Location	Chip No.	Possible Trouble
Dl	7404	No Ball - No Score
D2	7402	No Score Display - No Ball - Audio Distortion
D3	· <b>7</b> 430	No Display
D4	7410	Distorted Display
D5	7410	Distorted Display
D6	74153	Distorted Score
D7	7490	No Right Display
D8	7410	No Vertical Sync No Audio
D9	74107	Dead (Picture Rolls)
El	7400	Fast Serve - No Score
E2	7410	Distorted Left Display - No Right Display-No Ball
E3	7427	Distorted Display
E4	7404	Distorted Video (Picture Rolls)
E5	7427	Distorted Display - First Score Kills Game
<b>E</b> 6	7400	Dead
E <b>7</b>	7474	Dead .
E8	<b>7</b> 493	Dead
E9	7493	Dead Except Net (Picture Rolls)
Fl	7493	Fast Serve
F2	7425	Distorted Series of Displays
F3	74107	Distorted Audio and Net
F4 F5 F6 F7 F8 F9	NE555 7402 74107 7430 7493 7493	Stays in Game Over Distorted Video (Ficture Rolls) Dead Dead Dead Dead Dead

•

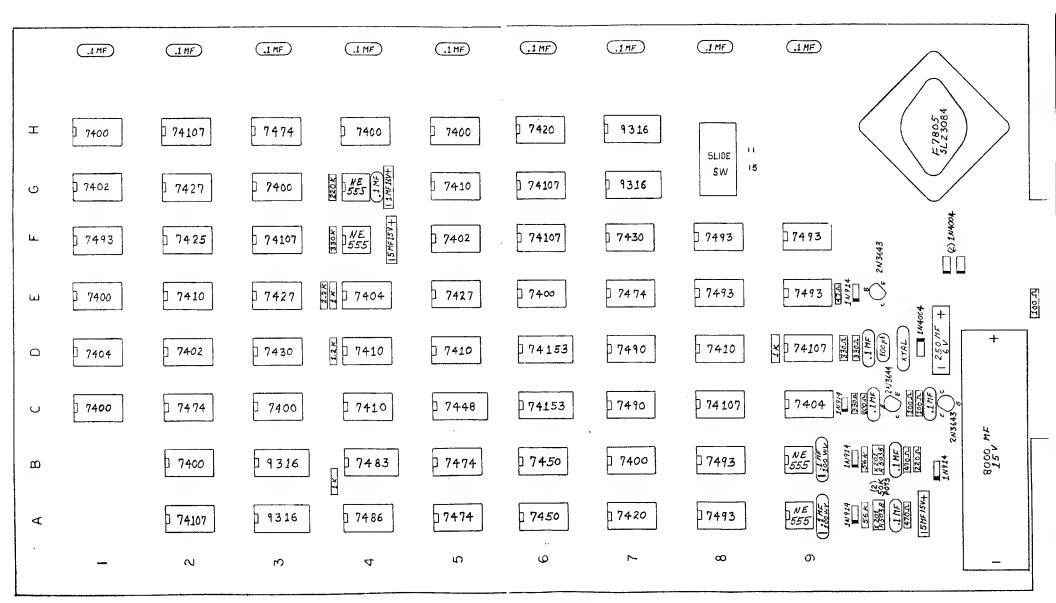
location	Chip No.	Possible Trouble
Gl	7402	No Video - Distorted Audio
G2	7427	Dead Except Display
G3	7400	Dead Except Display
G4	NE555	Distorted Audio
<b>G</b> 5	7410	Distorted Video (Picture Rolls) Distorted Audio - No Game Over
G6	74107	No Ball
G7	9316	No Ball
ні	7400	Ball Moves in Vertical direction only
Н2	74107	Ball Moves in Vertical direction only
Н3	7474	Distorted Paddles - No Score- No Game Over
H <b>4</b>	7400	No Ball
Н5	7400	Distorted Video (Picture Rolls)
н6	7420	Stay in Game Over
н7	9316	No Ball - No Score

.-

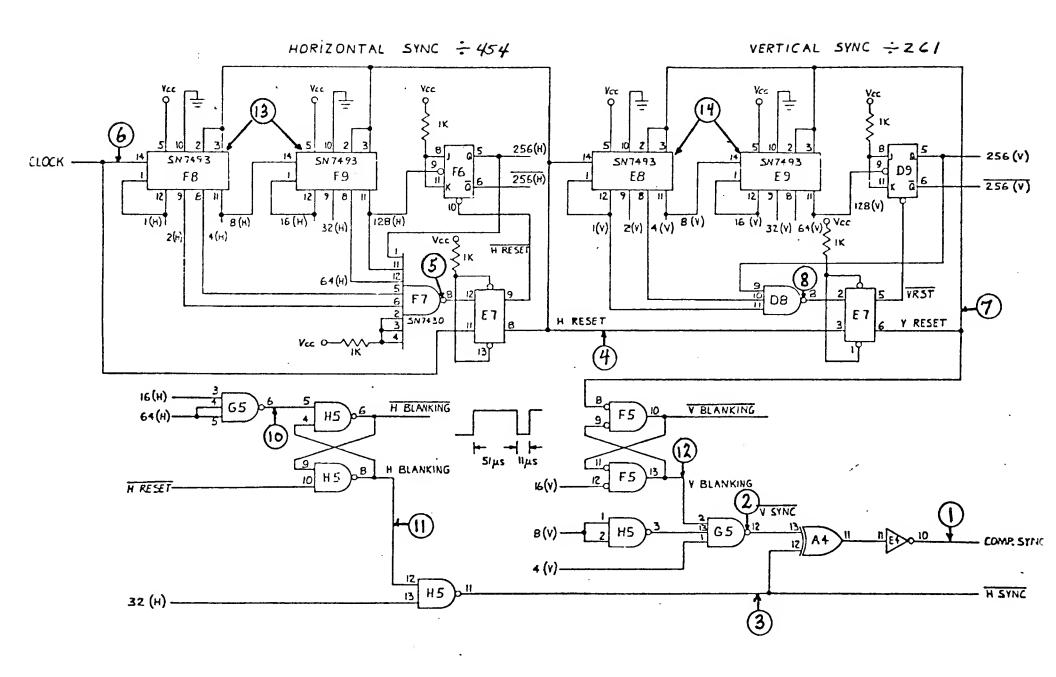
.

## WINNER LOGIC PC567-904

Chip Number	Function
7400	Quad. two input nand-gate.
7402	Quad. two input nor-gate.
7404	Hex. inverter.
7410	Triple nand-gate.
7425	Dual four input nor-gate with strobe.
7427	Positive nor-gate.
7430	Eight input or-gate.
7448	B.C.D. to seven segment decoder.
7450	Expandable dual two input and-or inverter gate.
7474	J-K Flip-Flop.
7 <b>4</b> 83	A four-bit binary full adder.
7490	Decade counter.
74107	Dual J-K Flip-Flop
74153	Dual 4 to 1 data selector multi-plexer.
9316	Four-bit counter low PWR. (up)

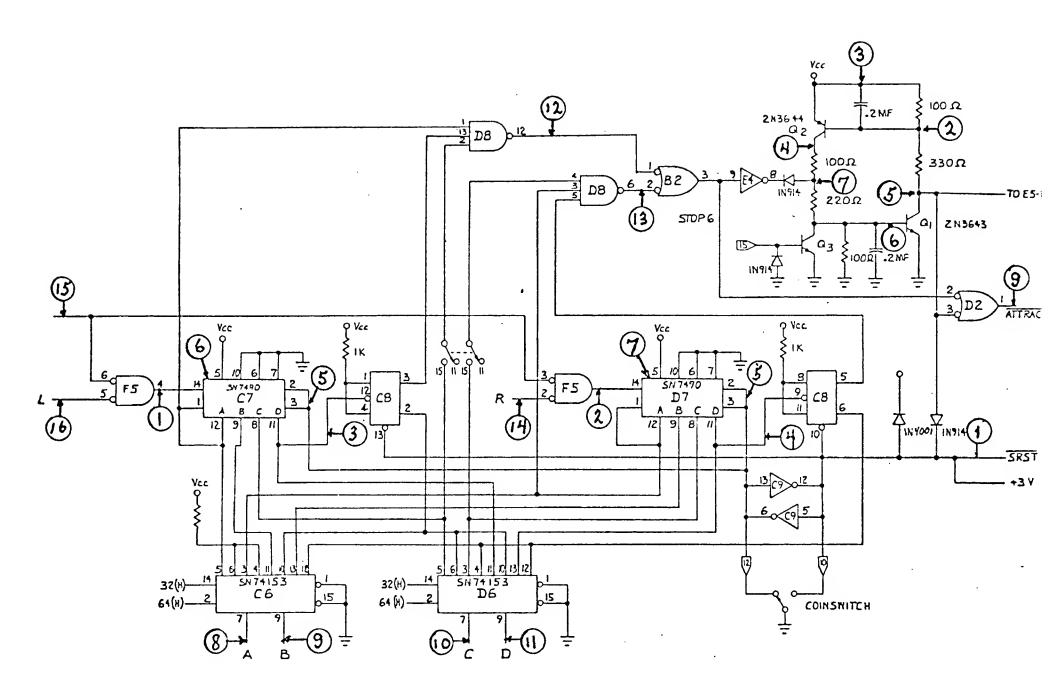


COMPONENT SIDE

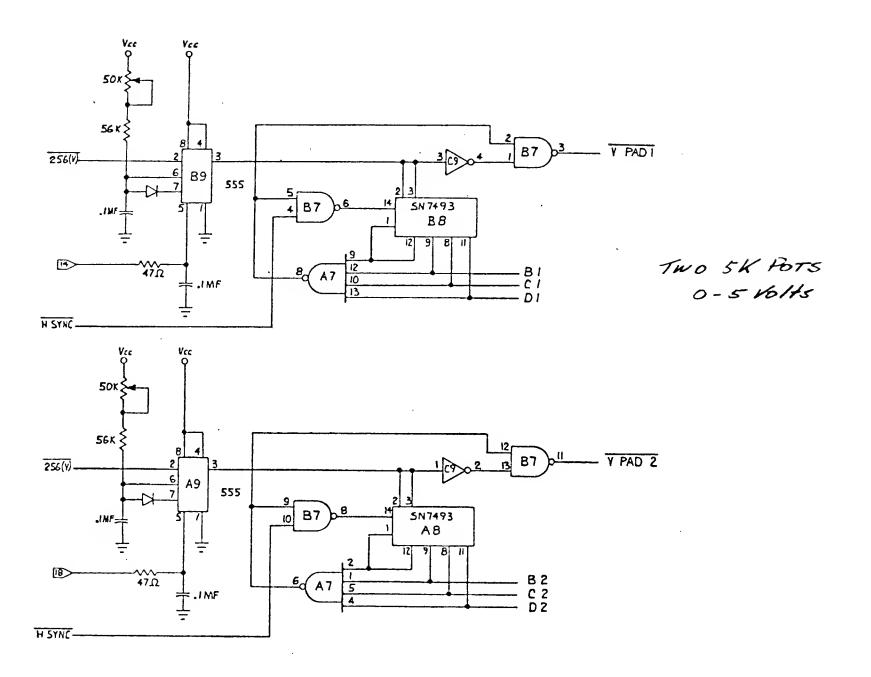


H&U TU SYNC

 $\bigcirc$ 

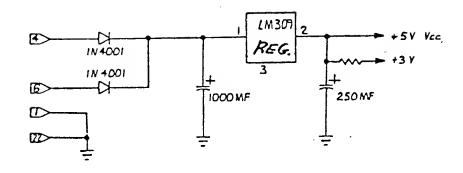


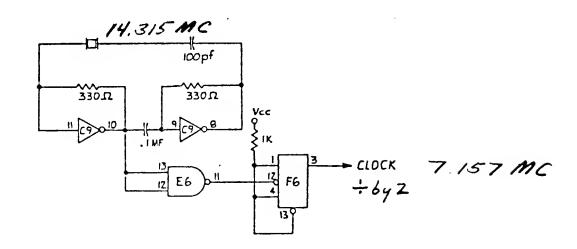
SCORE COUNTER'S



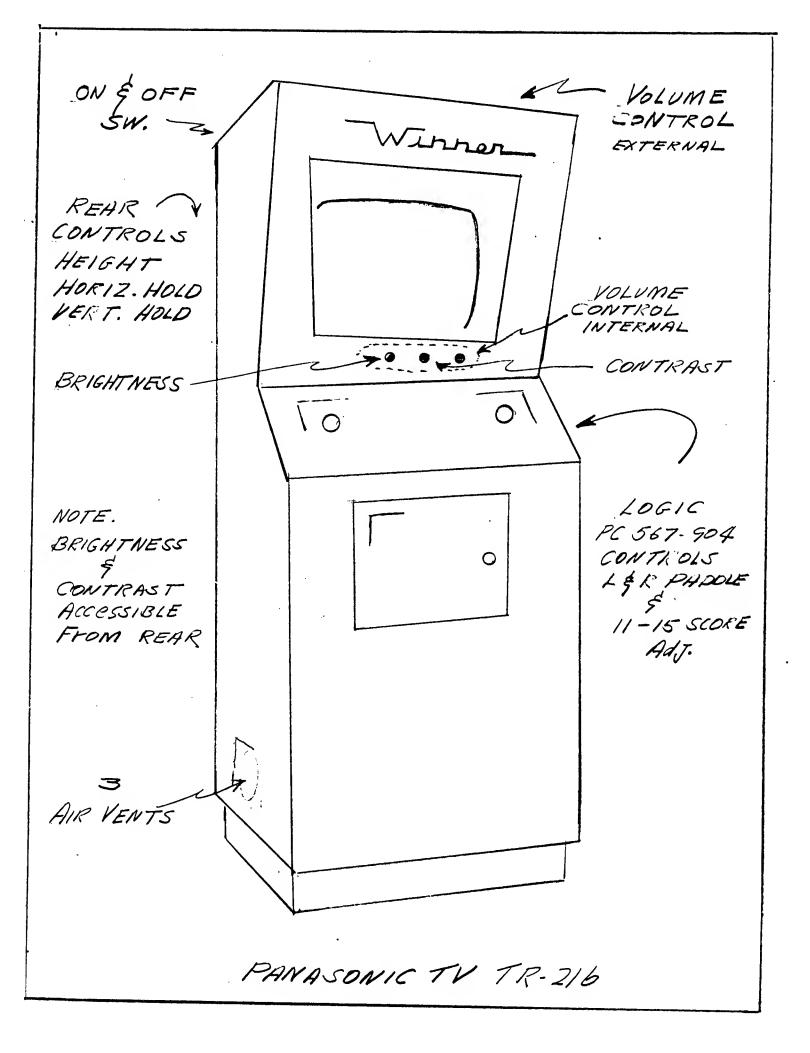
PANDLES L&R

4





POWER & CLOCK



## $\underline{W} \quad \underline{I} \quad \underline{N} \quad \underline{N} \quad \underline{E} \quad \underline{R}$

## Trouble Shooting Game Reset

#### COMPLAINT:

Game fails to reset properly (T.V. good).

#### CHECK THE FOLLOWING:

- 1.) Blown 1 amp slo-blow fuse (115 VAC).
- 2.) Transformer and associated wiring (MT-37).
- 3.) Coin switch #1 and #2 de-energizes the game over relay (M 33-1700).
- 4.) Game over relay switch adjustment (Yellow-Green and White-Blue) or (Black-Green and Orange-Black).
- 5.) Coin switch #1 and #2 energizes the coin relay.
- 6.) Open coin relay coil (M 33-1700).
- 7.) Coin relay switch adjustment (Red and Green or Black).
- 8.) Game logic unit jack connection pins #2, #4, #6, #7, #10, #12, #15, and #22.
- 9.) Defective logic unit, (PC 567-904) or game timer unit (PC 567-907).

## $\underline{W} \stackrel{\underline{I}}{=} \underline{N} \stackrel{\underline{N}}{=} \underline{E} \stackrel{\underline{R}}{=} \underline{R}$

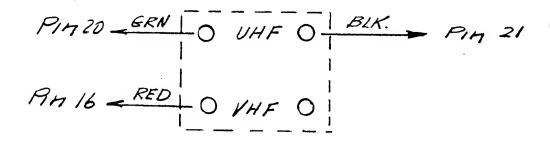
### TR-216 T.V. Modification

#### MAKE THE FOLLOWING CHANGES:

- 1.) Remove UHF and VHF internal-external antenna leads (tape).
- 2.) Cut one side of R-124 resistor (100 ohm).
- 3.) Connect TP-4 terminal with Green lead wire to internal UHF antenna. (Left side #3).
- 4.) Connect E-3 terminal with Black lead wire to internal UHF antenna. (Right side #4).
- 5.) Connect Red wire to the White wire of volume control cable.
- 6.) Connect external volume control in series with T.V. speaker.

NOTE: Steps #1 through #4 eliminate T.V. picture.

Steps #5 and #6 alter T.V. sound.



T.V ANTENNA TERMINALS VIEWED FROM REAK

## WINNER

Packard Bell T.V. Modification 2N621BG ...

## Factory Changes

- 1.) Remove all antenna leads and ground straps.
- 2.) Cut Brown and Brown-Yellow wires from on and off switch (splice and tape).
- 3.) Cut speaker leads and remove speaker (mounted externally).
- 4.) Disconnect 9 and 2 pt. jacks and remove tuner assembly.
- Cut green, yellow and ground wires at 9 pt. jack.
- 6.) Plug in 9 pt. adapter cable jack.
- 7.) Wire one end of added 3 wire cable to antenna terminals. Left side green then black and red (VHF & UHF).
- 8.) Solder green of 3 wire cable to terminal TP-3 (logic).
- 9.) Solder black of 3 wire cable to terminal link (ground).
- 10.) Solder red of 3 wire cable to yellow removed from 9 pt. jack (audio).
- 11.) Solder 47K ohm resistor across antenna terminals black and red.
- 12.) Cut one end of resistor R-119 (1.2k).
- 13.) Solder adapter cable black-yellow to 4 lug terminal strip with black.

Check T.V. set electrically in game.



December 4, 1973

#### POWER SUPPLY

Loss of 22V supply - suspect shorted Y402, open R404 or open R403.

Loss of 130V supply - suspect R403. Loss of 140V supply - suspect R402.

#### VERTICAL CIRCUITS

- 1. Loss of vertical sweep suspect Q205 first or Q202 second.
- 2. Bad vertical linearity or insufficient sweep suspect Q204 first and Q203 second.
- 3. Uneven vertical sweep (poor linearity) check values or R223 or R226. Adjust rings on yoke.
- 4. Four vertical sync. be sure I.F. AGC is full counter clock wise.
- 5. Poor vertical linearity could be caused by bad yoke.

#### HORIZONTAL CIRCUITS

- 1. No horizontal sweep suspect R263, R264, R265 or R266. Next suspect Q253. Always check Y253 when Q253 is defective. Suspect Y253 when there is no sweep.
- 2. If above checks are positive suspect Q251 then Q252.
- 3. Poor sync. be sure I.F. AGC is full counter clockwise.
- 4. Special horizontal circuit modification. To move picture 3/4 inch to left, put .01 capicator in parallel with C253. Readjust horizontal oscillator frequency with C251.

### HIGH VOLTAGE CIRCUITS

- 1. Y254 is first suspect.
- 2. Look for trouble in horizontal circuits.

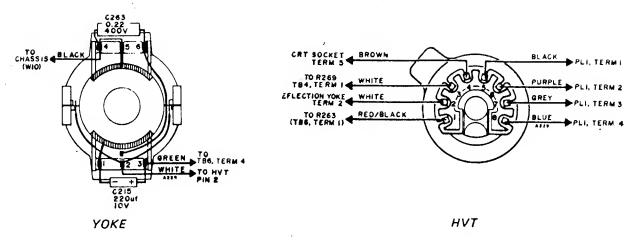
## VIDEO CIRCUITS

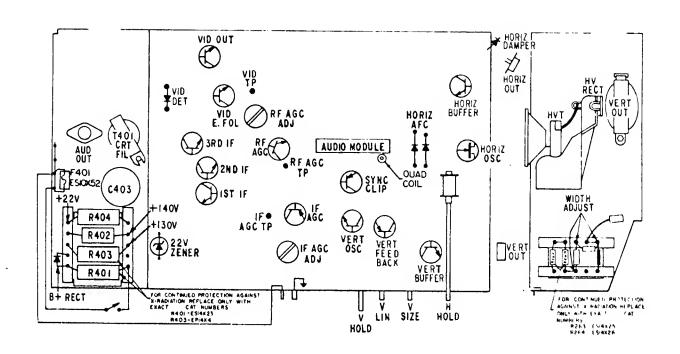
- 1. No Video suspect Q104 first, Q105 second.
- 2. Check Y102 if no picture.
- Poor contrast, be sure I.F. ACC is full counter clockwise.

#### SOUND CIRCUITS

- 1. No sound suspect Q301. If Q301 is defective, check R306 also.
- 2. No sound suspect R306.
- 3. No sound suspect T301.
- 4. No sound or distorted sound, replace a good audio module.

#### WIRING DIAGRAMS





CHASSIS LAYOUT

## CHASSIS REPLACEMENT PARTS LIST

	CAT. NO.	SYMBOL	DESCRIPTION
	ES49X60	R139	Control-IF AGC , 2.5K
	ES49X60	R147	Control-RF AGC , 2.5K
	ES49X61		Control-Triple
		R210	Height , 85K
		R215	Vertical Size, 16K
—.		R218	Vertical Lin., 2.5K
		SPECI	AL RESISTORS
	ES41X5	R232	Thermistor Assembly
	ES14X27	R233	Thermistor, 650 Ohms, 10%
	ES41X5	R261	Thermistor Assembly
	ES14X25	R263	Resistor-Wirewound, 27 Ohms, 10%, 5W
	ES14X26	R264	Resistor-Wirewound, 75 Ohms, 10%, 5W
	ES14X31	R265	Resistor-Wirewound, 27 Ohms,
	E'C LAVTI	Dace	10%, 2W
	ES14X31	R266	Resistor-Wirewound, 27 Ohms,
	ES13X3	D702	10%, 2W
	ES13X3	R307 R401	VDR(180-200V)
	-014743	101	Resistor-Wirewound, 5 Ohms, 10%, 10W
	EP14X4	R403	Resistor-Wirewound, 40 Ohms,
	•		10%, 15W
	ES14X24	R404	Resistor-Wirewound, 675 Ohms,
			5%, 22W
	(D)		PACITORS MIC, UNLESS NOTED)
		JOC, CENAL	MIC, ONLESS NOTED)
	EU18X562	C011	12pf, 10%, 500V, NPO
	ET22X82	C012	820pf, 10%, 500V
	ES31X36	C013	10mf, ELECTRO, +100 -10%, 16V
	ES22X6 EP18X34	C100 C101	1000pf, 20%, 50V, HiK
	EU18X417	C101	68pf., 5%, 500V, NPO 15pf, 5%, 500V, N750
	EP18X8	C103	27pf, 5%, 500V, NPO
	EP18X58	C104	15pf., 5%, 500V
1	ES18X43	C106	10,000pf, GMV, 50V
	EU22X91	C107	560pf, 10%, 500V
	ES18X43	C108	10,000pf, GMV, 50V
	ES22X6	C109	1000pf, 20%, 50V, HiK
	ES18X43	Clll	10,000pf, GMV, 50V
	EU18X533 ES22X6	C112	150pf, 5%, 500 V, NPO
	ES22X6	C113 C114	1000pf, 20%, 50V, HiK 1000pf, 20%, 50V, HiK
	ES18X58	C115	3300pf., 20%, 50V
	ES <b>22X6</b>	C116	1000pf, 20%, 50V, HiK
1	EU18X541	C117	82pf, 10%, 500V. NPO
	EU18X541 EU18X417	C117	82pf, 10%, 500V, NPO 15pf, 5%, 500V, N750
F			
H	EU18X417 EP18X47 ES22X6	C118	15pf, 5%, 500V, N750
H H	EU18X417 EP18X47 ES22X6 EP18X47	C118 C119 C120 C121	15pf, 5%, 500V, N750 10pf, 5%, 500V, NPO 1000pf, 20%, 50V, HiK 10pf, 5%, 500V, NPO
H H H	EU18X417 EP18X47 ES22X6 EP18X47 EP18X58	C118 C119 C120 C121 C122	15pf, 5%, 500V, N750 10pf, 5%, 500V, NPO 1000pf, 20%, 50V, HiK 10pf, 5%, 500V, NPO 15pf, 5%, 500V
H H H H	EU18X417 EP18X47 ES22X6 EP18X47 EP18X58 ET18X228	C118 C119 C120 C121 C122 C123	15pf, 5%, 500V, N750 10pf, 5%, 500V, NPO 1000pf, 20%, 50V, HiK 10pf, 5%, 500V, NPO 15pf, 5%, 500V 100pf, 10%, 500V, N750
H H H H	EU18X417 EP18X47 ES22X6 EP18X47 EP18X58 ET18X228 EP25X29	C118 C119 C120 C121 C122 C123 C124	15pf, 5%, 500V, N750 10pf, 5%, 500V, NPO 1000pf, 20%, 50V, HiK 10pf, 5%, 500V, NPO 15pf, 5%, 500V 100pf, 10%, 500V, N750 .1mf, 20%, 50V, (Mylar)
H H H H H	EU18X417 EP18X47 ES22X6 EP18X47 EP18X58 ET18X228 EP25X29 EU18X533	C118 C119 C120 C121 C122 C123 C124 C125	15pf, 5%, 500V, N750 10pf, 5%, 500V, NPO 1000pf, 20%, 50V, HiK 10pf, 5%, 500V, NPO 15pf, 5%, 500V 100pf, 10%, 500V, N750 .1 mf, 20%, 50V, (Mylar) 150pf, 5%, 500V, NPO
H H H H H H	EU18X417 EP18X47 ES22X6 EP18X47 EP18X58 ET18X228 EP25X29 EU18X533 ES31X42	C118 C119 C120 C121 C122 C123 C124 C125 C126	15pf, 5%, 500V, N750 10pf, 5%, 500V, NPO 1000pf, 20%, 50V, HiK 10pf, 5%, 500V, NPO 15pf, 5%, 500V 100pf, 10%, 500V, N750 .1mf, 20%, 50V, (Mylar) 150pf, 5%, 500V, NPO 10mf, ELECTRO, +100 -10%, 10V
	EU18X417 EP18X47 ES22X6 EP18X47 EP18X58 ET18X228 EP25X29 EU18X533 ES31X42 ET22X82	C118 C119 C120 C121 C122 C123 C124 C125 C126 C127	15pf, 5%, 500V, N750 10pf, 5%, 500V, NPO 1000pf, 20%, 50V, HiK 10pf, 5%, 500V, NPO 15pf, 5%, 500V 100pf, 10%, 500V, N750 .1mf, 20%, 50V, (Mylar) 150pf, 5%, 500V, NPO 10mf, ELECTRO, +100 -10%, 10V 820pf, 10%, 500V, HiK
	EU18X417 EP18X47 ES22X6 EP18X47 EP18X58 ET18X228 EP25X29 EU18X533 ES31X42 ET22X82	C118 C119 C120 C121 C122 C123 C124 C125 C126 C127 C128	15pf, 5%, 500V, N750 10pf, 5%, 500V, NPO 1000pf, 20%, 50V, HiK 10pf, 5%, 500V, NPO 15pf, 5%, 500V 100pf, 10%, 500V, N750 .1mf, 20%, 50V, (Mylar) 150pf, 5%, 500V, NPO 10mf, ELECTRO, +100 -10%, 10V 820pf, 10%, 500V, HiK 220pf, 10%, 500V
# E	EU18X417 EP18X47 ES22X6 EP18X47 EP18X58 ET18X228 EP25X29 EU18X533 ES31X42 ET22X82 EP22X4 EP25X10	C118 C119 C120 C121 C122 C123 C124 C125 C126 C127 C128 C129	15pf, 5%, 500V, N750 10pf, 5%, 500V, NPO 1000pf, 20%, 50V, HiK 10pf, 5%, 500V, NPO 15pf, 5%, 500V 100pf, 10%, 500V, N750 .1mf, 20%, 50V, (Mylar) 150pf, 5%, 500V, NPO 10mf, ELECTRO, +100 -10%, 10V 820pf, 10%, 500V, HiK 220pf, 10%, 500V 3300pf, 10%, 500V, Paper
H H H H H H H H H H H H H H H H H H H	EU18X417 EP18X47 ES22X6 EP18X47 EP18X58 ET18X228 EP25X29 EU18X533 ES31X42 ET22X82 EP22X4 EP25X10	C118 C119 C120 C121 C122 C123 C124 C125 C126 C127 C128 C129 C130	15pf, 5%, 500V, N750 10pf, 5%, 500V, NPO 1000pf, 20%, 50V, HiK 10pf, 5%, 500V, NPO 15pf, 5%, 500V 100pf, 10%, 500V, N750 .1mf, 20%, 50V, (Mylar) 150pf, 5%, 500V, NPO 10mf, ELECTRO, +100 -10%, 10V 820pf, 10%, 500V, HiK 220pf, 10%, 500V 3300pf., 10%, 500V, Paper .1mf, 20%, 200V (Mylar)
# # # # # # # # # # # # # # # # # # #	EU18X417 EP18X47 ES22X6 EP18X47 EP18X58 ET18X228 EP25X29 EU18X533 ES31X42 ET22X82 EP22X4 EP25X10 ES25X18	C118 C119 C120 C121 C122 C123 C124 C125 C126 C127 C128 C129 C130 C131	15pf, 5%, 500V, N750 10pf, 5%, 500V, NPO 1000pf, 20%, 50V, HiK 10pf, 5%, 500V, NPO 15pf, 5%, 500V 100pf, 10%, 500V, N750 .1mf, 20%, 50V, (Mylar) 150pf, 5%, 500V, NPO 10mf, ELECTRO, +100 -10%, 10V 820pf, 10%, 500V, HiK 220pf, 10%, 500V 3300pf., 10%, 500V, Paper .1mf, 20%, 200V (Mylar) 10mf, ELECTRO, +100 -10%, 10V
# E E E E E E E E E E E E E E E E E E E	EU18X417 EP18X47 ES22X6 EP18X47 EP18X58 ET18X228 EP25X29 EU18X533 ES31X42 ET22X82 EP22X4 EP25X10	C118 C119 C120 C121 C122 C123 C124 C125 C126 C127 C128 C129 C130 C131 C132	15pf, 5%, 500V, N750 10pf, 5%, 500V, NPO 1000pf, 20%, 50V, HiK 10pf, 5%, 500V, NPO 15pf, 5%, 500V 100pf, 10%, 500V, N750 .1mf, 20%, 50V, (Mylar) 150pf, 5%, 500V, NPO 10mf, ELECTRO, +100 -10%, 10V 820pf, 10%, 500V, HiK 220pf, 10%, 500V 3300pf., 10%, 500V, Paper .1mf, 20%, 200V (Mylar) 10mf, ELECTRO, +100 -10%, 10V 10mf, ELECTRO, +100 -10%, 25V
### ##################################	EU18X417 EP18X47 ES22X6 EP18X47 EP18X58 ET18X228 EP25X29 EU18X533 ES31X42 ET22X82 EP22X4 EP25X10 ES25X18 ES31X42	C118 C119 C120 C121 C122 C123 C124 C125 C126 C127 C128 C129 C130 C131	15pf, 5%, 500V, N750 10pf, 5%, 500V, NPO 1000pf, 20%, 50V, HiK 10pf, 5%, 500V, NPO 15pf, 5%, 500V 100pf, 10%, 500V, N750 .1mf, 20%, 50V, (Mylar) 150pf, 5%, 500V, NPO 10mf, ELECTRO, +100 -10%, 10V 820pf, 10%, 500V, HiK 220pf, 10%, 500V 3300pf., 10%, 500V, Paper .1mf, 20%, 200V (Mylar) 10mf, ELECTRO, +100 -10%, 10V

**POTENTIOMETERS** 

## # INDICATES PRODUCTION CHANGE

COMMON RESISTORS (CARBON, ½ WATT, 10%, IN OHMS, UNLESS NOTED)				
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
R001 R101 # R102 R103 R104 R105 R106 R108 R109 R110 R111 R112 R113 R114 R116 R117 R118 R119 R120 R121 R122 R123 R125 R126 R127 R128 R127 R128 R129 R131 R132 R133 R135 R136 R140 R141 R142 R143 R144 R145 R146 R146 R146 R147	100 10 470 18K, 5% 680 180 390 100 680 150 270 120 150 2,2K 8,2K 270 39K 1,2K, ¼ W 560, ¼ W 3,9K, ¼ W 1 meg., ¼ W 82K, 5% 180 560 100, 5% 10 8,2K, 2W 150K 1,1K, 5% 1K 10K 10CK 8,2K 27K 82 6,8K 56K 470 22K 220 4,7 560 1,8K	R205 R206 R207 R208 R209 R211 R212 R213 R214 R216 R217 R219 R220 R221 R222 R223 R224 R225 R226 R228 R229 R230 R250 R251 R252 R253 R254 R255 R256 R257 R258 R259 R260 R262 R270 R271 R301 R305 R306 R402	47K 8.2K 10K 39K 39K 820, 5% 1.5K 10K 10K 68K 200K, 5% 3.3K 220, 5% 1K 100, 5% 22, 5% 820 47K, 2W 22, 5% 1.5K 56K ¼W 4.7K 27K 1 meg. 1 meg. 27K 3.3 meg. 220K 1K 1.8K 820 1K 3.3 meg. 1 weg. 27K 3.3 meg. 220K 1K 1.8K 820 1K 3.3 meg. 220K 390 100K 91, 5% 470 2W	
R201 R203 R204	470 820 <b>K</b> , 5% 27K, 5%	R405	1.8K, 2W	

## CHASSIS REPLACEMENT PARTS LIST

# CAPACITORS (DISC, CERAMIC, UNLESS NOTED)

	CAT.NO.	SYMBOL	DESCRIPTION	
	EP18X34	#C136	68pf., 5%, 500V, NPO	
	EP18X58	# C137	15pf., 5%, 500V	
1	ES22X6	C201	1000pf, 20%, 50V, HiK	
i	ES31X40	C202	.47mf, ELECTRO, +150 - 10%, 50V	
Ì	ES22X3	C203	3300pf, 20%, 500V	
١	EP18X26	C204	10,000pf, 20%, 500V	
1	EP25 X29	C205	.1mf, 20%, 50 <b>V</b> (Mylar)	
I	ES25X9	C206	.033mf, 10%, 50V (Mylar)	
١	ES25 X 17	C207	.047mf, 50V, (Mylar)	
1	ES25X21	C208	.15mf, 10%, 50 <b>V</b> , (Mylar)	
1		C209		
-	ES31X41	C210	2.2mf, ELECTRO, +150 -10%, 50V	
1	COMMON	C212	.22mf, 10%, 600V (Molded)	
1	EU22X117	C213	1000pf, 20%, 500 <b>V</b> , SSHK	
ļ	ES31X42	C214	10mf, ELECTRO, +100 -10%, 10V	
Ī	ES31X39	C215	220mf, ELECTRO, +100 -10%, 10V	
l	EU22X127	C216	3300pf, 10%, 500V	
1	EU18X537	C251	47pf, 10%, 500 <b>V</b> , N330	
Ì	EU22X129	C252	2200pf, 10%, 500V, SSHK	
ĺ	ES20X2	C253	470pf, 5%, 500V, Mica	
i	ES25X20	C254	2700pf, 10%, 50V, (Mylar)	
İ	EP22X7	C255	5000pf, 10%, 500 <b>V</b>	
3	ES25X22	C257	.01mf, 5%, 50 <b>V</b> , (Mylar)	
	ES25X18	C258	.1 mf, 20%, 200 <b>V</b> , (Mylar)	
,	EU22X129	C259	2200pf, 10%, 500V, SSHK	
1	ES26X1	C261	2700pf, 5%, 1.2KV (Molded)	
t	ES31X44	C262	50mf, ELECTRO, +100 -10%, 150V	
	ES26X2	C263	.22mf, 10%, 400V, (Molded)	
	EP25X29	C264	.1 mt, 20%, 50V (Mylar)	
	ET18X329	C265	56pf, 5%, 500V, N750	
٠	ES31X43	C266	47mf, ELECTRO, +100 -10%, 16V	
	EP31X14	C308	1mf, ELECTRO, +150 - 10%, 50V	
	ET22X22	C309	10,000pf, 20%, 500V	
	EP25X28	C401	.047mf, 20%, 600V, (Mylar)	
	EP18X4	C402	1000pf, +80 -20%, 1KV	
	ES31X38	C403A	300mf, ELECTRO, 175V	
		C403B	30mf, ELECTRO, 150V	
		C403C	300mf, ELECTRO, 150V	
_	1	C403D	200mf, ELECTRO, 50V	

### **COILS AND TRANSFORMERS**

CAT. NO. SYMBOL		DESCRIPTION
EP36X92	#L101	Coil-Shaping
ES36X83	L102	Coil-41,25 MHz Trap
EP36X13	L103	Coil-47.25 MHz Trap
ES36X109	#L:04	Coil -Link Series
ES36X61	L105	Coil-88 MHz Choke ,10uh + 20%
LS36X84	L106	Coil-44 MHz Trap, 35.7uh
ES36X82	L107	Coil-220uh Peaking
ES36X86	L108	Coil-Sound Take-Off
€S36X87	L109	Coil-4.5 MHz Trap
EP36X17	L110	Coil-150uh Peaking Coil
ES36X88	L251	Coil-Horizontal Oscillator
©T36X536	L252	Coil-5.6uh
T36X536	L253	Coil-5.6uh
S76X6		Deflection Yoke
∴S56X7	T101	Transformer - Video Detector
S <b>64X11</b>	T201	Transformer - Vertical Output
•.S64X12	T251	Transformer - Horizontal Buffer
S77X12	T252	Transformer - High Voltage
		(Complete Asm. Less Rectifier and Anode Lead)
S64X13	T301	Transformer - Audio Output
'S64X10	T401	Transformer - CRT Filament

#### TRANSISTORS & DIODES

	<del></del>	<del></del>
CAT. NO.	SYMBOL	DESCRIPTION
ES15X104	Q101	Transistor - 1st I.F.
ES15X105	Q102	Transistor - 2nd I.F.
ES15X106	Q103	Transistor - 3rd 1,F,
EP15X1	Q104	Transistor - Video Emitter Follower
ES15X107	Q105	Transistor - Video Amp., w/Spacer
EP15X1	Q106	Transistor • RF AGC
ES15X90	Q107	Transistor - 1.F. AGC
ES15X90	Q201	Transistor - Clipper
EP15X1	Q202	Transistor - Vertical Oscillator
ES15X90	Q203	Transistor - Vertical Feedback
EP15X1	Q204	Transistor - Vertical Buffer
ES15X91	Q205	Transistor - Vertical Output, w/Insulator
ES15X92	Q251	Transistor - Horizontal Oscillator
ES15X93	Q252	Transistor - Horizontal Buffer
ES15X94	Q253	Transistor - Horizontal Output, w/Insulator
ES15X95	Q301	Transistor - Audio Output, w/Insulator
EP16X3	Y101	Diode - Video Detector
ES16X30	Y102	Diode - Video Clamping
ES16X27	Y103	Diode - AGC Coupling
ES16X27	Y201	Diode - Vertical Blanking
EP16X3	# ¥202	Diode - Vertical Coupling
ES16X27	¥203	Diode - Vertical Coupling
ES57X12	Y204	Diode - Vertical Damper
ES16X27	¥205	Diode - Vertical Feedback
ES16X27	Y251	Diode - Horizontal AFC
ES16X27	Y252	Diode - Horizontal AFC
ES16X28	Y253	Diode - Horizontal Damper
ES57X11	Y254	Rectifier - High Voltage
ES16X27	Y255	Diode - Horizontal Coupling
ES57X12	Y401	Rectifier - B+
ES16X29	¥402	Diode - 22 Volt Zener

### MISCELLANEOUS

CAT. NO. DESCRIPTION		
CAT. NO.	DESCRIPTION	
EP8X6	Anode Lead	
ES3X30	Clip - Transistor Mtg. (Q205)	
ET5X27	Clip - Yoke	
EP12X84	Core Half - H. V. Transformer	
ES1X29	Eyelet - H. V. Rectifier, Brass, w/Spring	
ET3X651	Fastener - Nylon, Transistor Socket	
EP10X52	Fuse - 4 Amp, Fast-Blow, Pigtail, 250V (F401)	
ES60X3	Heat Sink - Q105	
ES60X4	Insulator - Horiz, Output Transistor (Q253)	
EP38X6	Interlock Board - AC Power	
ES75X1	Module · Audio	
ET1X140	Screw - Hex Hd., No. 8-15 x 1/2"	
	Terminal Board Mounting	
EP1X7	Screw - Hex Hd., No. 8-15 x 3/8",	
	End Panels to Chassis	
ES69X6	Shaft - Nylon, Horizontal Hold	
ES34X11	Socket - Transistor (Q301)	
ES34X10	Socket - Transistor (Q253)	
ES34X12	Socket · CRT	
ES34X15	Socket - Transistor (Q205)	
ES34X13	Socket - Transistor (Q201, 203, 204, 251)	
ES34X14	Socket · Audio Module (Left & Right Halves)	
ES41X4	Spark Gap - (SG 101, 102)	
ES38X9	Terminal Board - Five Terminals, R263, 264	
	Mounting	
ET2X223	"U" Bolt - H. V. Transformer	

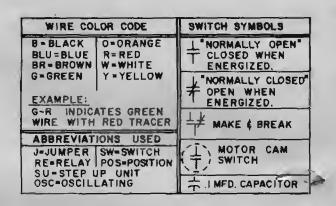
15

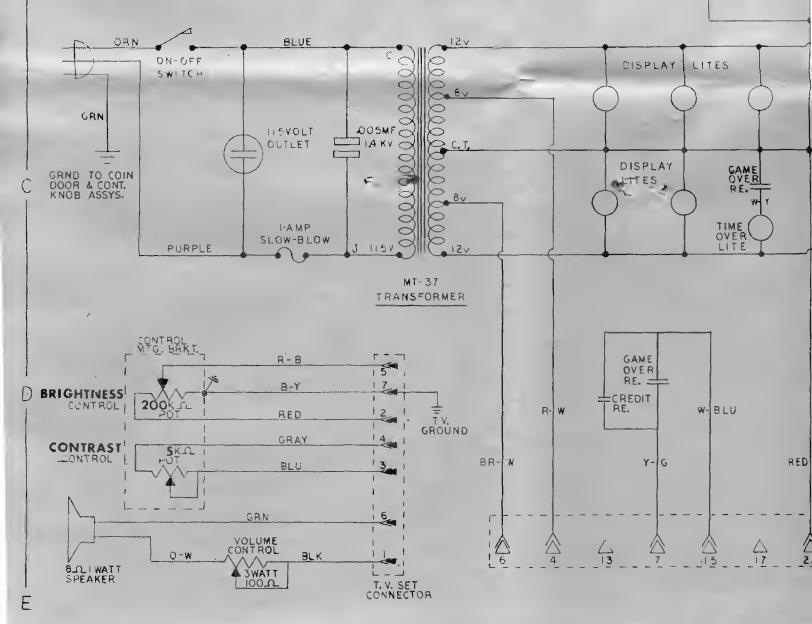
SEE PAGE TWO



GAME NO. 567 4-6-73

MIDWAY MFG. CO. 3750 RIVER RD. SCHILLER PK., ILL., U.S.A.





10 /

